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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,258	09/11/2003	Chien-Hsin Lai	4425-320	3535

7590 10/05/2005

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EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/659,258

Applicant(s)

LAI ET AL.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 20 and 21 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-19 is/are allowed.
- 6) ☒ Claim(s) 1-4 and 10-14 is/are rejected.
- 7) ☒ Claim(s) 5-9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of or the restriction requirement in the reply filed on 07/18/05 is acknowledged. The traversal is on the ground(s) that Examiner failed to demonstrate why the hypothetical process mentioned in the requirement can be regarded as a materially different process. Examiner points out that a process as mentioned would be materially different from the process of the non-elected claimed invention because it comprises different process steps.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 10-15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,187,454 to Collins et al.

4. Collins et al. disclose an impedance matching unit comprising: a plurality of adjustable inductors (column 1, rows 48-51), a plurality of adjustable capacitors (column 1, rows 48-51), a power measuring device (Figure 4, 30), a power comparator (Figure 4, 32) and an automatic impedance regulator (34) which connects said plurality of adjustable inductors, said plurality of adjustable capacitors and said power comparator for automatic impedance regulation.

5. With respect to claim 11, the unit comprises a voltage meter (column 13, rows 60-64).

6. With respect to claim 12, said power comparator comprises a transmitter (Figure 4, lines of circuit connecting 32 and 34).

7. With respect to claims 13 and 14, said automatic impedance regulator comprises a receiver (Figure 4, lines of circuit connecting 32 and 34) and a plurality of logic drive motors (column 5, rows 49-57—32.1 and 32.2 aid in logically driving the regulator toward an impedance match).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1 and 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,452,510 to Barnes et al. in view of U.S. Patent No. 5,900,062 to Loewenhardt et al.

11. Barnes et al. disclose a plasma apparatus substantially as claimed and capable of impedance matching, comprising: a plasma reactor (column 6, row 36) which produces plasma to proceed with chemical vapor deposition process; a bi-polar electrostatic chuck (Figure 1) which locates inside said plasma reactor to support and secure a wafer and said bi-polar electrostatic chuck has an inner electrode (100) and an outer electrode (200); a bias power (column 6, rows 42-44) which connects to said inner electrode and said outer electrode, and said power source provides the bias for ion-bombardment on said wafer; and an impedance matching unit (column 6, rows 44-60) connects between said bias power and said bi-polar electrostatic chuck in order to balance a power output of said inner electrode and a power output of said outer electrode.

12. However, Barnes et al. fail to teach the bias power source as an alternating current power source.

13. Loewenhardt et al. disclose that it is typical to use an DC bias source or an AC bias source for electrostatically biasing a wafer (column 1, rows 28-30).

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14. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an AC biasing power source in Barnes et al. in order to electrostatically bias a wafer in a typical manner as taught by Loewenhardt et al.

15. With respect to claims 3 and 4, which are drawn to processing parameters of the processing apparatus that would be adapted to suit a desired process/use of the apparatus, the courts have ruled that Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). The courts have also ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

16. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barnes et al. as applied to claims 1 and 3-4 above and further in view of Applicant's Admitted Prior Art.

17. Barnes et al. and Loewenhardt et al. disclose the invention substantially as claimed and as described above.

18. However, Barnes et al. fail to specifically disclose an alternating current plasma generating power.

19. In Applicant's specification, paragraph 2 of "Description of the Prior Art", it is disclosed that it is known in the art to use an alternating current plasma generation source for the purpose of generating plasma in an HDPCVD process.

20. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an alternating current plasma generation source in Barnes et al. and Loewenhardt et al. in order to carry out an HDPCVD process as is known in the art and is taught in Applicant's admitted prior art.

Allowable Subject Matter

21. Claims 5-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

22. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach or fairly suggest a plasma apparatus capable of performing adaptive impedance matching between the two electrodes of an bi-polar electrostatic chuck as claimed and described above and further comprising a plurality of adjustable impedance elements, a power measuring device, a power comparator and an automatic impedance regulator.

23. Claims 15-19 are allowed.

24. The following is an examiner's statement of reasons for allowance: The prior art of record fails to teach or fairly suggest a plasma apparatus capable of performing adaptive impedance matching between the two electrodes of an bi-polar electrostatic chuck as claimed and described above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

26. USP 5812361; 6215640; 6252354; 6414562; and 6562160; 5964184 and 20040163594 each disclose an electrostatic bipolar chuck and/or impedance matching similar to the claimed invention.

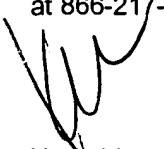
27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC)

at 866-217-9197 (toll-free).



Karla Moore
Patent Examiner
Art Unit 1763
30 September 2005